

United States General Accounting Office

Report to the Chairman, Subcommittee  
on Defense, Committee on  
Appropriations, U.S. Senate

GAO

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# TEST AND EVALUATION

Projects Funded by  
DOD's Central Test  
and Evaluation  
Investment Program

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National Security and  
International Affairs Division

B-242427

April 30, 1991

The Honorable Daniel K. Inouye  
Chairman, Subcommittee on Defense  
Committee on Appropriations  
United States Senate

Dear Mr. Chairman:

This report is in response to your request that we review projects funded by the Department of Defense's (DOD) Central Test and Evaluation Investment Program (CTEIP). You requested specific information on (1) the justification for the projects, (2) any duplication among the CTEIP projects, (3) the execution of the fiscal year 1990 and 1991 projects, and (4) the projects' outyear funding profiles.

## Background

In early 1988, DOD began a review of test and evaluation capability needs and investment trends. The review identified shortfalls of about \$12 billion in major test resources that touched virtually all areas of DOD's test capabilities. Because a program of this magnitude was not likely during a time of reduced defense budgets, DOD took steps to establish a program that it believed was affordable.

In November 1988, DOD centrally funded the most critical needs by creating CTEIP. The goal of the program was to fund high-priority test and evaluation requirements, ensuring adequate and timely test capabilities to support DOD's weapon system acquisition programs. Under the program, the Office of the Secretary of Defense (OSD) provides funds to the services to execute test and evaluation projects in support of major weapon system acquisitions. The services award contracts and operate the projects on a day-to-day basis. To control the program's funds, OSD and the services agree on the objectives, management approach, and costs of each project.

DOD requested about \$166 million for the program in fiscal year 1990, and the Congress appropriated \$83 million. In fiscal year 1991, the Congress appropriated \$112 million for CTEIP—about \$74 million less than DOD's \$185.9 million request. The program was estimated to cost almost \$1.6 billion from fiscal years 1990 to 1997.

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## Results in Brief

Our review showed that

- CTEIP criteria for justifying the projects may change, primarily to emphasize multiservice applications, because of congressional concerns with the program;
- CTEIP projects generally complement and do not unnecessarily duplicate each other;
- funding levels of some CTEIP projects changed significantly because of increased projected benefits or the inability to execute the projects in a timely manner; and
- because of funding cuts, many CTEIP projects were extended into the outyears beyond the original time frame of fiscal years 1990 to 1994.

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## Justification for the Projects

OSD is attempting to establish new criteria to more fully justify the CTEIP projects. Under the program, a CTEIP project initiated by OSD or the services had to meet at least one of several requirements. They had to (1) be part of an acquisition involving a large, one-of-kind technical facility; (2) have a tri-service application, high national priority, joint service or agency application, or high potential for improving the acquisition process; or (3) augment projects that are unique to a service but satisfy broader DOD requirements. Because the requirements were broad and all-encompassing, an OSD official said, any number of projects proposed by the services could be justified on the basis of at least one of these requirements.

OSD officials told us that because not all of these requirements were of equal importance, OSD and the services had planned to assign a relative weight based on the importance of each applicable selection criterion and rank the projects in priority. According to these officials, this weighting system would have favored projects that had multiservice applications, were considered to be high national priorities, and could be developed under the program for procurement by the services. OSD officials further added that they had wanted the weighting system to preclude the acquisition of single-service projects and one-of-a-kind items.

Instead of adopting the ranking system, DOD officials said that for fiscal year 1992 CTEIP will be restructured to resolve congressional concerns, primarily by emphasizing multiservice applications. In Conference Report 101-938 dealing with DOD appropriations for fiscal year 1991, the House and Senate conferees called for an elimination of projects that

serve only a single service, have a low priority, or are duplicative. Further, the Senate Committee on Appropriations report on DOD appropriations for fiscal year 1991 concluded that CTEIP should be a development and coordination program geared toward multiservice application of any systems that are fielded.

Of the 28 projects, we found that 16 are intended to meet multiservice needs. For example, the Common Airborne Instrumentation System project is expected to provide standard instrumentation systems for each service to test its own aircraft. The remaining 12 projects meet a single-service need. For example, several Navy projects, such as the Deep Water Range and Portable Tracking System projects, meet a single-service need.

## Interrelationships Among CTEIP Projects

The CTEIP projects generally complemented, rather than duplicated, one another. Three projects, for example, are part of the Air Force's "scientific test process" for testing electronic warfare systems. These projects—Red Mission Analysis, Air Force Electronic Warfare Evaluation Simulator (AFEWES) Upgrade, and Real-Time Electromagnetic Digitally Controlled Analyzer and Processor (REDCAP) Upgrade—work together by combining computer models and simulations. AFEWES can take the models developed with the Red Mission Analysis project and integrate them with actual hardware and personnel into the testing process. REDCAP is similar to AFEWES in that each represents a part of the electronic combat environment that an aircraft would face.

CTEIP also has three Global Positioning System (GPS) projects that complement one another.<sup>1</sup> The Air Force's GPS Range Applications project will develop the equipment and demonstrate it at nine different locations. Then the Army and Navy GPS projects are to purchase GPS equipment developed under the Air Force project to meet specific service requirements established for specific ranges.

<sup>1</sup>DOD is acquiring a separate GPS system designed to provide users with worldwide time-space-position information. On the other hand, CTEIP's GPS projects are developing and procuring GPS equipment to be used on test ranges.

## Execution of the Projects for Fiscal Years 1990 and 1991

During fiscal year 1990, funding for seven projects changed significantly because of projected benefits or problems in executing contracts. Four projects received \$610,000 to \$2 million each in additional funding in anticipation of future benefits. For example, OSD officials believed that the Aerial Cable Facility was critically needed to enhance DOD's testing capability and decided to provide funding for the project by shifting some fiscal year 1990 program funds.

In contrast, the fiscal year 1990 funding for three other projects was reduced by about \$1.1 million to \$4.9 million each because the projects were not executed as planned. For example, the Smart Munitions Test Suite was not executed because the service had not prepared the required documentation prior to awarding a contract. As another example, the Multiple Object Tracking Radar Procurement project was delayed because a timely decision on whether to pay for the radars all at once or year-by-year was not made.

Service officials generally anticipated no problems in expending the fiscal year 1991 funds budgeted for the projects. These officials said that existing or new contracts could be used to obligate the funding.

Appendix I lists funding levels for fiscal years 1990 and 1991.

## Outyear Funding Profiles

Our analysis indicated that as of August 1990, 9 of the 28 projects were planned to be fully funded and completed within the original time frame of fiscal years 1990 to 1994.<sup>2</sup> For example, the Air Force's GPS Range Applications project was scheduled to be funded as originally planned through fiscal year 1994. OSD decided to support this project so that the services could purchase the GPS equipment at a reduced price. As another example, AFEWES was scheduled to be funded as originally planned through fiscal year 1992, with the Air Force providing the additional funding needed for the project through fiscal year 1994.

OSD absorbed funding cuts, such as the congressional \$83 million reduction in fiscal year 1990, by extending 18 of the 28 projects into the outyears beyond fiscal year 1994, rather than canceling projects.

<sup>2</sup>DOD proposed funding 30 projects from fiscal years 1990 to 1997. However, DOD decided to terminate the Air Force's Electronic Combat Digital Evaluation System because DOD believed the project had a lower priority than the other projects. Nevertheless, DOD believes that the project offers benefits to the testing of electronic warfare programs. The Space Aging and Surveillance project, which was to study the effects of space aging, was terminated because space equipment that was obtained by the National Aeronautics and Space Administration made the project obsolete.

During fiscal year 1990, OSD provided funds for the Aerial Cable Facility, which was not one of the original projects identified to the Congress as needing funding. According to DOD officials, the project was added because it was critically needed and environmental concerns forced the operations of an existing cable at a different location to be shut down.

Appendix II shows the outyear funding profiles as of August 1990 for the CTEIP projects.

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## Scope and Methodology

Because our reporting time frame was short, we relied extensively on discussions with DOD officials and obtained limited documentation supporting the justification for the projects maintained by OSD and the services. We examined Project Management Plans that outlined such things as the need for the projects. In some cases, we reviewed draft plans because final plans were not complete at the time of our review.

We compared the objectives of the 28 projects to determine the interrelationships among them and whether they unnecessarily duplicated each other.

OSD provided us with actual funds obligated during fiscal year 1990 for each project and planned funding for fiscal year 1991. We interviewed service officials to determine whether the projects used the funding budgeted for fiscal year 1990 and whether the officials anticipated any problems in spending fiscal year 1991 funds.

By comparing the original cost of the program as presented in the President's April 1989 budget to the revised outyear funding profile as of August 1990, we identified whether significant revisions had been made in the outyear funding profiles for the projects as a result of changed funding levels.

We performed our review from July to November 1990 at various sites in the Washington, D.C., metropolitan area, including the Naval Air Test Center, Patuxent River, Maryland. We performed our work in accordance with generally accepted government auditing standards. We did not obtain agency comments. However, the views of agency officials were sought during the course of our work and are incorporated where appropriate.

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More detailed descriptions of the individual CTEIP projects are discussed in a supplement to this report, Test and Evaluation: Description of Projects in DOD's Central Test and Evaluation Investment Program (GAO/NSIAD-91-111S).

We are sending copies of this report to the Secretaries of Defense, the Navy, the Army, and the Air Force and to interested congressional committees. Copies will also be made available to others on request. Due to its length, we are limiting distribution of the supplement to appropriate congressional members and DOD agencies.

Please contact me on (202) 275-8400 if you or your staff have any questions concerning the report or supplement. Major contributors to the report and supplement are listed in appendix III.

Sincerely yours,

A handwritten signature in black ink, appearing to read "Paul F. Math". The signature is stylized with a large, looped "P" and "M".

Paul F. Math  
Director, Research, Development,  
Acquisition, and Procurement Issues





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## Abbreviations

AFEWES	Air Force Electronic Warfare Evaluation Simulator
CTEIP	Central Test and Evaluation Investment Program
DOD	Department of Defense
GPS	Global Positioning System
OSD	Office of the Secretary of Defense
REDCAP	Real-Time Electromagnetic Digitally Controlled Analyzer and Processor



# Funding for the Projects in Fiscal Years 1990 and 1991

Dollars in thousands

Project name (number)	Fiscal year			
	1990 plan <sup>a</sup>	1990 actual <sup>b</sup>	1991 plan <sup>b</sup>	1991 target <sup>b,c</sup>
<b>Air Force</b>				
Stores Certification Capability Upgrade Program (1-05-F)	\$6,500	\$6,300	\$14,220	\$12,798
Global Positioning System Range Applications Joint Program Office Development (1-10-F)	23,500	25,000	23,370	21,033
Red Mission Analysis (2-01-F)	0	0	1,500	1,350
Electronic Combat Digital Evaluation System (2-02-F) <sup>d</sup>	0	0	0	0
Air Force Electronic Warfare Evaluation Simulator Upgrade (2-03-F)	10,325	9,260	11,600	10,440
Real-Time Electromagnetic Digitally Controlled Analyzer and Processor Upgrade (2-04-F)	1,000	800	3,600	3,240
Electronic Warfare Vulnerability Analysis (2-05-F)	250	279	500	450
Space Aging and Surveillance Project (3-01-F) <sup>d</sup>	250	60	0	0
Department of Defense (DOD) Space Test Capability (3-02-F)	3,000	3,000	7,030	6,327
Scene Generation Test Capability (6-01-F)	2,500	2,000	3,600	3,240
Climatic Test Chamber Upgrade (6-02-F)	0	100	1,600	1,440
<b>Subtotal</b>	<b>47,325</b>	<b>46,799</b>	<b>67,020</b>	<b>60,318</b>
<b>Army</b>				
Smart Munitions Test Suite (1-01-A)	4,200	745	8,980	8,082
Army Range Global Positioning System (1-02-A)	400	413	5,140	4,626
Ground Based Radar-Experimental Upgrade (1-04-A)	0	2,000	11,000	9,900
Multiple Object Tracking Radar Procurement (1-09-A)	5,300	380	25,380	22,842
Target Control-White Sands Missile Range (1-13-A)	300	235	800	720
Air Defense Capability (2-08-A)	500	645	1,000	900
Aerial Cable Facility (5-02-A)	0	1,750	1,000	900
Test and Evaluation Command Support	0	385	0	0
<b>Subtotal</b>	<b>10,700</b>	<b>6,553</b>	<b>53,300</b>	<b>47,970</b>
<b>Navy</b>				
Multiple Object Tracking Radar Installation (1-03-N)	0	0	1,300	1,170
Navy Range Global Positioning System (1-06-N)	1,900	2,510	14,850	13,365
Deep Water Range (1-07-N)	450	510	950	855
Portable Tracking System (1-08-N)	925	970	2,140	1,926
Common Airborne Instrumentation System (1-12-N)	2,700	745	11,970	10,773
Air Combat Environment Test and Evaluation Facility (2-06-N)	9,000	9,150	12,600	11,340
Combat Environment Realism System (2-07-N)	100	320	5,100	4,590
Underwater Weapon Simulator (2-09-N)	3,200	3,200	7,900	7,110
Anti-Radiation Missile Targets (5-01-N)	3,300	3,300	4,360	3,924
Naval Air Systems Command Support	0	15	0	0
<b>Subtotal</b>	<b>21,575</b>	<b>20,720</b>	<b>61,170</b>	<b>55,053</b>

(continued)

**Appendix I**  
**Funding for the Projects in Fiscal Years 1990**  
**and 1991**

Project name (number)	Fiscal year			
	1990 plan <sup>a</sup>	1990 actual <sup>b</sup>	1991 plan <sup>b</sup>	1991 target <sup>b,c</sup>
Office of the Secretary of Defense and Defense Nuclear Agency				
Test Technology Development and Demonstration (1-11-D)	\$3,105	\$2,580	\$3,500	\$3,150
Large Blast/Thermal Simulator (4-01-D)	0	0	0	0
Radiation Effects Test Facility (4-02-D)	900	900	900	810
Management Support	4,000	4,377	0	0
<b>Subtotal</b>	<b>8,005</b>	<b>7,857</b>	<b>4,400</b>	<b>3,960</b>
<b>Total</b>	<b>\$87,605</b>	<b>\$81,929</b>	<b>\$185,890</b>	<b>\$167,301</b>

<sup>a</sup>Figures represent funding as of March 1990.

<sup>b</sup>Figures represent funding as of August 1990.

<sup>c</sup>Target funding represents 90 percent of fiscal year 1991 plan.

<sup>d</sup>This project was terminated by DOD in fiscal year 1990.

Source: Office of the Secretary of Defense.

# Projected Outyear Funding for the Projects

Dollars in thousands

Project name (number)	Fiscal year								Total
	1990	1991	1992	1993	1994	1995	1996	1997	
Air Force									
Stores Certification Capability Upgrade Program (1-05-F)	\$6,300	\$14,220	\$25,000	\$27,100	\$16,400	\$16,480	0	0	\$105,500
Global Positioning System Range Applications Joint Program Office Development (1-10-F)	25,000	23,370	14,937	11,507	8,177	0	0	0	82,991
Red Mission Analysis (2-01-F)	0	1,500	4,400	4,600	3,200	2,700	0	0	16,400
Electronic Combat Digital Evaluation System <sup>a</sup> (2-02-F)	0	0	0	0	0	0	0	0	0
Air Force Electronic Warfare Evaluation Simulator Upgrade (2-03-F)	9,260	11,600	6,100	0	0	0	0	0	26,960
Real-Time Electromagnetic Digitally Controlled Analyzer and Processor Upgrade (2-04-F)	800	3,600	6,000	0	0	0	0	0	10,400
Electronic Warfare Vulnerability Analysis (2-05-F)	279	500	2,500	6,800	8,600	9,400	0	0	28,079
Space Aging and Surveillance Project <sup>a</sup> (3-01-F)	60	0	0	0	0	0	0	0	60
DOD Space Test Capability (3-02-F)	3,000	7,030	23,200	19,960	14,160	45,790	\$35,050	\$10,100	158,290
Scene Generation Test Capability (6-01-F)	2,000	3,600	6,600	1,000	0	0	0	0	13,200
Climatic Test Chamber Upgrade (6-02-F)	100	1,600	4,800	23,300	32,800	0	0	0	62,600
Subtotal	46,799	67,020	93,537	94,267	83,337	74,370	35,050	10,100	504,480
Army									
Smart Munitions Test Suite (1-01-A)	745	8,980	11,996	23,299	19,581	21,269	0	0	85,870
Army Range Global Positioning System (1-02-A)	413	5,140	9,531	11,974	15,000	20,274	0	0	62,332
Ground Based Radar Experimental Upgrade (1-04-A)	2,000	11,000	15,000	12,000	5,000	1,000	0	0	46,000
Multiple Object Tracking Radar Procurement (1-09-A)	380	25,380	25,380	26,090	25,760	0	0	0	102,990
Target Control-White Sands Missile Range (1-13-A)	235	800	4,739	3,376	3,100	3,249	1,184	0	16,683
Air Defense Capability (2-08-A)	645	1,000	3,260	6,600	10,900	15,000	15,000	15,000	67,405
Aerial Cable Facility (5-02-A)	1,750	1,000	3,200	7,600	2,100	200	0	0	15,850
Test and Evaluation Command Support	385	0	0	0	0	0	0	0	385
Subtotal	6,553	53,300	73,106	90,939	81,441	60,992	16,184	15,000	397,515

(continued)

**Appendix II**  
**Projected Outyear Funding for the Projects**

Project name (number)	Fiscal year								Total
	1990	1991	1992	1993	1994	1995	1996	1997	
Navy									
Multiple Object Tracking Radar Installation (1-03-N)	0	\$1,300	\$1,900	\$700	\$400	\$700	\$100	0	\$5,100
Navy Range Global Positioning System (1-06-N)	\$2,510	14,850	9,950	10,820	14,700	0	0	0	52,830
Deep Water Range (1-07-N)	510	950	2,000	11,000	17,400	22,055	10,185	0	64,100
Portable Tracking System (1-08-N)	970	2,140	3,235	5,930	5,980	6,580	6,855	0	31,690
Common Airborne Instrumentation System (1-12-N)	745	11,970	11,000	12,500	10,000	5,000	0	0	51,215
Air Combat Environment Test and Evaluation Facility (2-06-N)	9,150	12,600	31,500	39,100	10,600	29,800	28,720	\$18,700	180,170
Combat Environment Realism System (2-07-N)	320	5,100	8,600	7,500	4,000	5,500	6,800	10,000	47,820
Underwater Weapon Simulator (2-09-N)	3,200	7,900	9,800	10,700	11,600	9,700	7,400	3,000	63,300
Anti-Radiation Missile Targets (5-01-N)	3,300	4,360	6,050	5,972	3,832	0	0	0	23,514
Naval Air Systems Command Support	15	0	0	0	0	0	0	0	15
Subtotal	20,720	61,170	84,035	104,222	78,512	79,335	60,060	31,700	519,754
Office of the Secretary of Defense and Defense Nuclear Agency									
Test Technology Development and Demonstration (1-11-D)	2,580	3,500	6,000	9,000	12,000	12,000	12,500	13,000	70,580
Large Blast/Thermal Simulator (4-01-D)	0	0	6,840	0	0	0	0	0	6,840
Radiation Effects Test Facility (4-02-D)	900	900	8,600	25,300	20,600	4,200	0	0	60,500
Management Support	4,377	0	0	0	0	0	0	0	4,377
Subtotal	7,857	4,400	21,440	34,300	32,600	16,200	12,500	13,000	142,297
Total	\$81,929	\$185,890	\$272,118	\$323,728	\$275,890	\$230,897	\$123,794	\$69,800	\$1,564,046

Note: Figures represent funding as of August 1990

<sup>a</sup>This project was terminated by DOD in fiscal year 1990

Source: Office of the Secretary of Defense

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